

c. Amendments to Claims

1. (Currently amended) An apparatus for mode converting, comprising:
first and second optical waveguides; and
a GRIN fiber lens attached to both the first and the second waveguides; and
wherein one end of the GRIN fiber lens is attached directly to an end of the first
optical waveguide and an opposite end of the GRIN fiber lens is attached directly to an
end of the second optical waveguide.
2. (Currently amended) The apparatus of claim 1, wherein the attached ends
of the first and second waveguides are fused or glued to the GRIN fiber lens.
3. (Original) The apparatus of claim 2, wherein the first and second waveguides
are first and second optical fibers, respectively.
4. (Original) The apparatus of claim 3, wherein the first fiber has propagation
modes with different sizes than the second fiber.
5. (Original) The apparatus of claim 3, wherein the lens has a magnification, the
magnification times the size of a fundamental propagation mode of the first fiber being
about equal to the size of a fundamental propagation mode of the second fiber.
6. (Original) The apparatus of claim 3, wherein the first and second fibers have
cores with different diameters.
7. (Original) The apparatus of claim 3, wherein each fiber has a core and a
cladding; and a discontinuity in refractive index across an interface between the core and
cladding, the discontinuities being different across the interfaces of the first and second
fibers.
8. (Original) The apparatus of claim 3, wherein the GRIN fiber lens comprises a
series of connected GRIN fiber lenses; the first GRIN fiber lens of the series being

attached to the first fiber and the last GRIN fiber lens of the series being attached to the second fiber.

9. (Original) The apparatus of claim 1, wherein the GRIN fiber lens has a core with a graded refractive index profile, the profile having a radial second derivative whose average magnitude is less than about 2.4×10^{-5} microns⁻² in the core.